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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/331,631	06/21/99	MANNERS	J DULLN23.001A

HM22/0608

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EXAMINER
ROBINSON, H

ART UNIT	PAPER NUMBER
1653	5

DATE MAILED: 06/08/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/331,631	Applicant(s) Manners et al.
	Examiner Hope Robinson	Group Art Unit 1653

Responsive to communication(s) filed on Oct 1, 1999

This action is FINAL.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 1 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

Claim(s) 1-41 is/are pending in the application.

Of the above, claim(s) 4-10, 12, 14, 15, 24-29, 31-33, and 35-40 is/are withdrawn from consideration.

Claim(s) _____ is/are allowed.

Claim(s) 1-3, 11, 13, 16-23, 30, 34, and 41 is/are rejected.

Claim(s) _____ is/are objected to.

Claims _____ are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on Jun 21, 1999 is/are objected to by the Examiner.

The proposed drawing correction, filed on _____ is approved disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some* None of the CERTIFIED copies of the priority documents have been

received.

received in Application No. (Series Code/Serial Number) PCT/AU97/00874.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). 4

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-3, 11, 13, 16-23, 30, 34 and 41 are drawn to an isolated protein, classified in class 530, subclass 350.
- II. Claims 4-10, 24-29, 35 and 38 are drawn to an isolated DNA, classified in class 435, subclass 6.
- III. Claims 12, 14, 15, 31-33, 36-37, 39-40 are drawn to a method of controlling microbial infestation, classified in class 435, subclass 455.

The inventions are distinct, each from the other because of the following reasons:

The nucleic acids of Invention II are related to the protein of Invention I respectively, by virtue of encoding same. The DNA molecule has utility for the recombinant production of the protein in a host cell, recited. Although the DNA molecule and protein are related since the DNA encodes the specifically claimed protein, they are distinct inventions because the protein product can be made by another and materially different process, such as by synthetic peptide synthesis or

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purification from the natural source. Further, the DNA may be used for process other than the production of the protein, such as nucleic acid hybridization assay.

Inventions I and III are related since the product of Invention I is used in the method of invention III. However, the two groups are patentably distinct each from the other because this is alternative method that the product of Invention I can be used in. Further the method steps of Invention III does not make the product of Invention I. The same is true for the product of Invention II.

The inventions above are independent and distinct, each from the other. They have acquired a separate status in the art as a separate subject for inventive effect and require independent searches. The search for each of the above inventions is not co-extensive particularly with regard to the literature search. A reference which would anticipate the invention of one group would not necessarily anticipate or make obvious any of the other groups. Moreover, as to the question of burden of search, classification of subject matter is merely one indication of the burdensome nature of the search involved.

The literature search, particularly relevant in this art, is not co-extensive and is much more important in evaluating the burden of search. Burden in examining materially different groups having materially different issues also exist. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification and because of their recognized divergent subject matter, election of a single group for examination purposes as indicated is proper.

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2. During a telephone conversation with Mr. David Altman on May 8, 2000 a provisional election was made without traverse to prosecute the Invention of Group I, Claims 1-3, 11, 13, 16-23, 30, 34 and 41. Affirmation of this election must be made by applicant in responding to this Office action. Claims 4-10, 12, 14-15, 24-29, 31-33 and 35-40 are withdrawn from further consideration by the examiner, 37 CFR 1.142 (b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48 (b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently filed petition under 37 CFR 1.48 (b) and by the fee required under 37 CFR 1.17 (h).

3. The preliminary amendment filed on June 21, 1999 has been received and entered.

Specification

4. The disclosure is objected to because of the following informalities:

The specification is objected to because the raw sequence listing of SEQ ID No: 27 indicates that the sequence has 16 residues, yet the specification on page 4 shows the sequence as having 17 residues. In addition, the Brief Description of the Drawings on page 6 of the specification indicates that Figure 3 shows “percent growth inhibition”, however, the figure reads

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“percent inhibition”. Additionally, Figure 4 is disclosed as an illustration of MIAMP2a, b, c, and d, however, the figure illustrates “Mi2a, b, c, and d”. The specification is further objected to because on page 9 the disclosure has the English spelling of the word “stabilization” (see line 32 for “stabilisation”). See also page 14, line 10 and page 14, line 27 where the words “stabilising” and “stabilisers” are also objected to. Furthermore, the word “formation” on page 11, line 10 is spelled incorrectly as “fomation”. Correction is required also on page 15 of the specification where the word “from” is repeated twice adjacent to each other. Additionally, see the words “microtitre” and “microlitres” on page 16, line 12 and 20; page 16, line 19; and page 17, line 24 which also have English spellings.

Abstract

5. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Drawings

6. The drawings filed on June 21, 1999 are objected to because Figure 13 and 15 are missing a portion of the Western Blot. See also the Draftsperson’s Review Comments. Correction is required.

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Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 2; 11, 13, 16-23, 30, 34 and 41 are rejected under 35 U.S.C. 112 second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 18 are indefinite because the recited C-2X-C-3X-C(10-12)-X-C-3X-C-3X-C is not SEQ ID Nos: 37-39 as the first 2X is incorrect. These sequences show a C-Xaa-Xaa-Xaa as the first four residues. Thus the C-2X and the final -3X-C appear to be missing from the sequences in the listing.

Claim 2 is indefinite because it contains apparent recitation of sequences without the requisite “selected from the group consisting of” terminology as sequences 1, 3 and 5 are not one sequence but 3 sequences.

Claim 11 should be rewritten as “of” instead of “according to” in-so-far-as Claim 1 is not a process claim. According to, would infer “steps”.

Claim 13 is indefinite since (a) the claim does not indicate the effect of controlling; (b) that the time and conditions of application are effective to produce the effect indicated in (a).

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Claim 16 is indefinite because (1) “obtaining or designing” require steps which are unrecited; (2) it is not apparent which residues would or would not be selected to only achieve “substantially” the same distribution of positive charges, and (3) if item (a) and (b) are already done, what is the necessity of item (c) of Claim 16 else there is a missing step (d) of isolating the protein.

Claims 19, 21 and 22 are vague and indefinite because in Claims 19 and 21 the sequence listing recites residues 29 to 94 for SEQ ID NO: 23 which only has 33 residues based on the raw sequence listing. In addition, SEQ ID NO: 27 is recited in Claim 22 as containing 17 residues and the sequence disclosure indicates that there are 16 residues for this sequence. The dependent claims are included in this rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103 (a), the examiner presumes that the subject matter of the various claims was

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commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103 (c) and potential 35 U.S.C. 102 (f) or (g) prior art under 35 U.S.C. 103 (a).

9. Claims 1-3, 11, 13, 16-23, 30, 34 and 41 are rejected under 35 U.S.C. 103 (a) as being unpatentable over McHenry et al. (Plant Molecular Biology, vol. 18, pages 1173-1176, 1992) in view of Duvick et al. (U.S. Patent No. 5,905,187, May 17, 1995) and Spencer et al. (U.S. Patent No. 5,770,433, January 21, 1993).

McHenry et al. disclose Cocoa (*Theobroma cacao*) seeds which produce two abundant mRNA transcripts during mid to late development, the protein products of which may be constituents of chocolate flavor components. In addition, McHenry et al. assert that one third of the abundant mRNA encodes a protease inhibitor and the other two thirds encode a seed storage protein, cocoa seed *vicilin*. McHenry et al. also disclose the conservation of the following sequence: four Cys-X-X-X-Cys motifs which characterize the first exon of cotton *vicilin* which are present in the cocoa protein (see Figure 1 and page 1173). McHenry et al. teach the sequences contained in SEQ ID Nos: 1, 3 and 31-39 of the present application with a high sequence identity (see the alignments). McHenry et al. do not expressly teach an antimicrobial composition.

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Duvick et al. disclose CMIII, a small, basic maize seed peptide found to have antimicrobial activity against common plant pathogens (see abstract and column 2). Furthermore, Duvick et al. provide a method of killing plant pathogens comprising introducing into the environment of the organisms an antimicrobial amount of a CMIII. The CMIII can be effectively applied to plants infested with microorganisms by spray, dust or other formulation common to the antimicrobial arts. Duvick et al. teach that the CMIII can also be incorporated into the tissues of a susceptible plant so that in the course of infesting the plant the pathogens will be exposed to antimicrobial amounts of CMIII (see column 2). In addition, Duvick et al. teach the sequence contained in SEQ ID No. 23 (entire sequence) with a 100% sequence identity (see the alignment).

Spencer et al. disclose the identification of 47 kD and 31 kD proteins and their 67 kD expression precursor, believed to be the source of peptide flavor precursors in cocoa (*Theobroma cacao*). Spencer et al. also disclose the identity and sequence of genes coding for the proteins and have synthesized recombinant proteins (see abstract and columns 1 and 2). In addition, Spencer et al. teach the sequences contained in SEQ ID Nos: 1, 3, 25, 28 of the instant application with a sequence identity of 96.7%, 100%, 100% and 60.9% respectively.

In view of the foregoing, it would have been obvious to one of ordinary skill in the art to combine the teachings of the above references to arrive at the claimed invention as a whole because McHenry et al. in view of Duvick et al. teach a protein with antimicrobial activity and the sequences contained in the instant application with a high sequence identity as exhibited by the alignments. Further, the sequences that are not taught by McHenry et al. and Duvick et al. are

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disclosed in Spencer et al. and the combined teachings of all three references renders the claimed invention as obvious since an antimicrobial protein capable of controlling plant infestation by pathogens, the protein fragments disclosed in the instant application derived from the species *Thebroma cacao* and the encoding DNA are taught by the references above. Thus, the claimed invention was obvious to make and use at the time it was made and was *prima facie* obvious.

Conclusion

10. No claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hope Robinson whose telephone number is (703) 308-6231. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:30 pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher S. F. Low, can be reached at (703) 308-2923.

Any inquiries of a general nature relating to this application should be directed to the Group Receptionist whose telephone number is (703) 308-0196.

Papers related to this application may be submitted by facsimile transmission. The official fax phone number for Technology Center 1600 is (703) 308-4242. Please affix the examiner's name on a cover sheet attached to your communication should you choose to fax your response.

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The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG (November 15, 1989).

Hope Robinson, MS *[Signature]*

Patent Examiner

Christopher S. F. Low
CHRISTOPHER S. F. LOW
SUPERVISORY PATENT EXAMINER
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